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EXAMINER

LI, SHI K

ART UNIT

PAPER NUMBER

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11

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/755,136

Applicant(s)

WAY, WINSTON

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10 and 20 is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-19 and 21-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

The proposed drawing correction filed on 25 August 2003 is approved. Corrected drawings are required in reply to this Office action.

Claim Objections

1. Claim 8 is objected to because of the following informalities: "Mach-Zender" in line 2 of the claim should be "Mach-Zehnder". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30-37 and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 30 recites the limitation "optically modulating" in line 14 of the claim. The term "modulate/modulating" has been used in other claims without the word "optically". It is unclear about the difference between "modulate/modulating" and "optically modulate/modulating".
5. Claim 31 recites the limitations "a second electrical control signal" in line 18 of the claim and "the second electrical control signals" in line 21-22 of the claim. It is unclear whether there is one second electrical control signal or a plurality of second electrical control signals.
6. Claim 35 recites the limitation "the optical signal" in line 21 of the claim. There is insufficient antecedent basis for this limitation in the claim. The claim contains first optical

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signal, second optical signal, third optical signal and optical data signal. It is unclear which optical signal is referred to.

7. Claim 41 recites the limitations "optically modulating" in line 12 of the claim and "optically filtering" in line 15 of the claim. The terms "modulate/modulating" and "filter/filtering" have been used in other claims without the word "optically". It is unclear about the difference between "modulate/modulating" and "optically modulate/modulating", and between "filter/filtering" and "optically filter/filtering".

Claim Rejections - 35 USC § 102

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1-4 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Cisneros et al. (U.S. Patent 5,539,559).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets.

Regarding claims 4 and 15, Cisneros et al. teaches in FIG. 7 the extraction of address information from the packets and controlling the laser current drivers (LCD) and receiver voltage drivers (RVD).

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Boncek (U.S. Patent 5,617,233).

Cisneros et al. has been discussed above in regard to claims 1-4 and 13-15. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not carry label (or header) in a channel distinct from the reserved wavelength buffer and active wavelength buffer. Boncek teaches in FIG. 1 and FIG. 2 that header and data can be transmitted in two different wavelengths. One of ordinary skill in the art would have been motivated to combine the teaching of Boncek with the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use separate channels for label and data signal, as taught by Boncek, in the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process.

12. Claims 6-8 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Adamczyk et al. (O. Adamczyk et al., "All-Optical Output-Port Contention Resolution Using Subcarrier-Multiplexing", Optical Fiber Communication Conference 2000, 7-10 March 2000).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. uses a tunable laser to shift the wavelength. Adamczyk et al. teaches in FIG. 2 that in-band wavelength shift can be

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accomplished via subcarrier modulation. Adamczyk et al. includes in FIG. 2 a local oscillator and a Mach-Zehnder modulator. One of ordinary skill in the art would have been motivated to combine the teaching of Adamczyk et al. with the ATM switch of Cisneros et al. because oscillator and Mach-Zehnder modulator together is cheaper and more reliable than a laser light source and its associated circuit. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use subcarrier modulation for shifting wavelength, as taught by Adamczyk et al., in the ATM switch of Cisneros et al. because oscillator and Mach-Zehnder modulator together is cheaper and more reliable than a laser light source and its associated circuit.

13. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Masetti et al. (F. Masetti et al., "High Speed, High Capacity ATM Optical switches for Future Telecommunication Transport Networks", IEEE Journal on Selected Areas in Communications, Vol. 14, No. 5, June 1996).

Cisneros et al. has been discussed above in regard to claims 1-4. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not teaches the use of SOA for wavelength converter. Masetti et al. teaches in Table II various wavelength converters. SOA is preferred over other methods because it has high bandwidth. One of ordinary skill in the art would have been motivated to combine the teaching of Masetti et al. with the ATM switch of Cisneros et al. because SOA has high bandwidth. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use SOA as wavelength converter, as taught by Masetti et al., in the ATM switch of Cisneros et al. because SOA can handle high data rate signal.

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14. Claims 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Takeyari et al. (U.S. Patent 5,838,475) and Frigo et al. (U.S. Patent 6,466,342 B1).

Cisneros et al. has been discussed above in regard to claims 1-4 and 13-15. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not teach the regenerating of the label and data. Takeyari et al. teaches in FIG. 5 an optical-electrical-optical regenerator with jitter correction. One of ordinary skill in the art would have been motivated to combine the teaching of Takeyari et al. with the ATM switch of Cisneros et al. because noise such as jitter accumulates after a packet has been routed through several nodes and it is desirable to remove such noise to reduce errors. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use O-E-O regenerator, as taught by Takeyari et al., in the ATM switch of Cisneros et al. because the O-E-O regenerator of Takeyari et al. removes jitter and reduces errors.

The modified ATM switch of Cisneros et al. and Takeyari et al. still fails to teach the generation of an optical carrier from the input signal. Frigo et al. teaches in Fig. 2a the extraction of an optical carrier from the input signal. One of ordinary skill in the art would have been motivated to combine the teaching of Frigo et al. with the modified ATM switch of Cisneros et al. and Takeyari et al. because reusing the carrier ensures that it has the same wavelength along the transmission network, minimizes the interference with the other channels and makes the arrangement wavelength independent and, therefore, simplifies maintenance. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to extract an optical carrier from the input signal, as taught by Frigo et al., in the modified

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ATM switch of Cisneros et al. and Takeyari et al. because reusing the carrier ensures that it has the same wavelength along the transmission network, minimizes the interference with the other channels and makes the arrangement wavelength independent and, therefore, simplifies maintenance.

15. Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Takeyari et al. (U.S. Patent 5,838,475).

Cisneros et al. has been discussed above in regard to claims 1-4 and 13-15. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not teach the regenerating of the label and data. Takeyari et al. teaches in FIG. 5 an optical-electrical-optical regenerator with jitter correction. One of ordinary skill in the art would have been motivated to combine the teaching of Takeyari et al. with the ATM switch of Cisneros et al. because noise such as jitter accumulates after a packet has been routed through several nodes and it is desirable to remove such noise to reduce errors. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use O-E-O regenerator, as taught by Takeyari et al., in the ATM switch of Cisneros et al. because the O-E-O regenerator of Takeyari et al. removes jitter and reduces errors.

16. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Spring et al. (J. Spring et al., "Photonic Header Replacement for Packet Switching", Electronics Letters, Vol. 29, No. 17, 19th August 1993).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band

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wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is the processing of the signal. Spring et al. teaches in FIG. 1 a header (label) replacement module. FIG. 1 comprises splitters to split the signal into 3 branches. The O/E device extracts the header from the signal; SOA2 filters the signal and acts as a modulator for the new header; SOA1 filters the data to remove the old header. The new header and the data signal are combined at the output. One of ordinary skill in the art would have been motivated to combine the teaching of Spring et al. with the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the header replacement circuit of Spring et al. in the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate.

17. Claims 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Chao et al. (H. Chao et al., "A Photonic Front-End Processor in a WDM ATM Multicast Switch", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000) and Masetti et al. (F. Masetti et al., "High Speed, High Capacity ATM Optical switches for Future Telecommunication Transport Networks", IEEE Journal on Selected Areas in Communications, Vol. 14, No. 5, June 1996).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not teach the

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processing of the label and data signals. Chao et al. teaches in FIG. 16 to separate a packet into header and data, update the header to reflect information changes and recombine the new header with the data. One of ordinary skill in the art would have been modified to combine the teaching of Chao et al. with the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to separately process the data and header and update the header with new information, as taught by Chao et al., in the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination.

The modified ATM switch of Cisneros et al. and Chao et al. still fails to teach the modulation of the data signal to shift its wavelength. Masetti et al. teaches in Table II various wavelength converters (or optical modulator with optical modulating signal). Wavelength converters change the wavelength of an optical signal without converting the signal to electrical format. SOA is preferred over other converting methods because it has high bandwidth. One of ordinary skill in the art would have been motivated to combine the teaching of Masetti et al. with the modified ATM switch of Cisneros et al. and Chao et al. because SOA has high bandwidth. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use SOA as wavelength converter, as taught by Masetti et al., in the modified ATM switch of Cisneros et al. and Chao et al. because SOA can handle high data rate signal.

18. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Chao et al. (H. Chao et al., "A Photonic Front-End Processor

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in a WDM ATM Multicast Switch", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000) and Adamczyk et al. (O. Adamczyk et al., "All-Optical Output-Port Contention Resolution Using Subcarrier-Multiplexing", Optical Fiber Communication Conference 2000, 7-10 March 2000).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The differences between Cisneros et al. and the claimed invention are (a) the separate process of the label and data signal, and (b) the frequency shift of the data signal. Chao et al. teaches in FIG. 16 to separate a packet into header and data, update the header to reflect information changes and recombine the new header with the data. One of ordinary skill in the art would have been modified to combine the teaching of Chao et al. with the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to separately process the data and header and update the header with new information, as taught by Chao et al., in the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination.

The modified ATM switch of Cisneros et al. and Chao et al. still fails to teach the use of a local oscillator to frequency shift the optical signal for resolving wavelength contention. Adamczyk et al. teaches in FIG. 2 that in-band wavelength shift can be accomplished via

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subcarrier modulation. Adamczyk et al. includes in FIG. 2 a local oscillator and a Mach-Zehnder modulator. One of ordinary skill in the art would have been motivated to combine the teaching of Adamczyk et al. with the modified ATM switch of Cisneros et al. and Chao et al. because oscillator and Mach-Zehnder modulator together is cheaper and more reliable than a laser light source and its associated circuit. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use subcarrier modulation for shifting wavelength, as taught by Adamczyk et al., in the modified ATM switch of Cisneros et al. and Chao et al. because oscillator and Mach-Zehnder modulator together is cheaper and more reliable than a laser light source and its associated circuit.

19. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Spring et al. (J. Spring et al., "Photonic Header Replacement for Packet Switching", Electronics Letters, Vol. 29, No. 17, 19th August 1993) and Takeyari et al. (U.S. Patent 5,838,475).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is the processing of the signal. Spring et al. teaches in FIG. 1 a header (label) replacement module. FIG. 1 comprises splitters to split the signal into 3 branches. The O/E device extracts the header from the signal; SOA2 filters the signal and acts as a modulator for the new header; SOA1 filters the data to remove the old header. The new header and the data signal are combined at the output. One of ordinary skill in

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the art would have been motivated to combine the teaching of Spring et al. with the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the header replacement circuit of Spring et al. in the ATM switch of Cisneros et al.

because the circuit of Spring et al. can swap labels with high data rate.

The modified ATM switch of Cisneros et al. and Spring et al. still fails to suggest the regeneration of the data signal in O-E-O format. Takeyari et al. teaches in FIG. 5 an optical-electrical-optical regenerator with jitter correction. One of ordinary skill in the art would have been motivated to combine the teaching of Takeyari et al. with the modified ATM switch of Cisneros et al. and Spring et al. because noise such as jitter accumulates after a packet has been routed through several nodes and it is desirable to remove such noise to reduce errors. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use O-E-O regenerator, as taught by Takeyari et al., in the modified ATM switch of Cisneros et al. and Spring et al. because the O-E-O regenerator of Takeyari et al. removes jitter and reduces errors.

20. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al., Spring et al. and Takeyari et al. as applied to claim 31 above, and further in view of Sun et al. (H. Sun et al., "Tunable Compensation of Dispersion-Induced RF Power Degradation in Multiple-Channel SCM Transmission by Nonlinearly-Chirped FBGs", CLEO '99, 1999).

Cisneros et al., Spring et al. and Takeyari et al. have been discussed above in regard to claim 31. The difference between Cisneros et al., Spring et al. and Takeyari et al. and the claimed invention is that Cisneros et al., Spring et al. and Takeyari et al. do not teach subcarrier

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modulation for the data and label. The modified ATM switch of Cisneros et al., Spring et al. and Takeyari et al. uses TDM for the label and the data. However, it is well known in the art that data and label can be combined using other multiplexing techniques such as frequency division multiplexing or wavelength division multiplexing. For example, Sun et al. teaches in FIG. 1 that two signals can be frequency multiplexed and then modulate a light beam to form a OFDM signal. One of ordinary skill in the art would have been motivated to combine the teaching of Sun et al. with the modified ATM switch of Cisneros et al., Spring et al. and Takeyari et al. because SCM can carry multiple channels (i.e., multiplex packet streams) in one wavelength which has wide bandwidth. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use SCM (or OFDM) technique, as taught by Sun et al., in the modified ATM switch of Cisneros et al., Spring et al. and Takeyari et al. because SCM can carry multiple channels in one wavelength.

21. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Spring et al. (J. Spring et al., "Photonic Header Replacement for Packet Switching", Electronics Letters, Vol. 29, No. 17, 19th August 1993) and Takeyari et al. (U.S. Patent 5,838,475).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is the processing of the signal. Spring et al. teaches in FIG. 1 a header (label) replacement module. FIG. 1 comprises splitters to split the

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signal into 3 branches. The O/E device extracts the header from the signal; SOA2 filters the signal and acts as a modulator for the new header; SOA1 filters the data to remove the old header. The new header and the data signal are combined at the output. One of ordinary skill in the art would have been motivated to combine the teaching of Spring et al. with the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the header replacement circuit of Spring et al. in the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate.

The modified ATM switch of Cisneros et al. and Spring et al. still fails to suggest the regeneration of the data signal. Takeyari et al. teaches in FIG. 5 an optical-electrical-optical regenerator with jitter correction. One of ordinary skill in the art would have been motivated to combine the teaching of Takeyari et al. with the modified ATM switch of Cisneros et al. and Spring et al. because noise such as jitter accumulates after a packet has been routed through several nodes and it is desirable to remove such noise to reduce errors. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use O-E-O regenerator, as taught by Takeyari et al., in the modified ATM switch of Cisneros et al. and Spring et al. because the O-E-O regenerator of Takeyari et al. removes jitter and reduces errors.

22. Claims 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Boncek (U.S. Patent 5,617,233) and Adamczyk et al. (O. Adamczyk et al., "All-Optical Output-Port Contention Resolution Using Subcarrier-Multiplexing", Optical Fiber Communication Conference 2000, 7-10 March 2000).

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Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The differences between Cisneros et al. and the claimed invention are (a) Cisneros et al. does not teach a channel for label information, and (b) the processing of the label and data signals. Boncek teaches in FIG. 1 and FIG. 2 that header and data can be transmitted in two different wavelengths and a couple is used to separate the header and the data, process the header and data and then combine them with an optical combiner. Adamczyk et al. teaches in FIG. 2 the use of a MZ-modulator to shift the signal frequency to resolve wavelength contention. One of ordinary skill in the art would have been motivated to combine the teaching of Boncek and Adamczyk et al. with the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process and resolving wavelength contention with subcarrier technique is cheaper and more reliable than using a laser light source. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use separate channels for label and data signal, as taught by Boncek, and use subcarrier modulation technique to resolve wavelength contention, as taught by Adamczyk et al., in the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process and resolve wavelength contention with subcarrier technique is cheaper and more reliable than using a laser light source.

23. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Chao et al. (H. Chao et al., "A Photonic Front-End Processor

in a WDM ATM Multicast Switch", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is that Cisneros et al. does not teach the process of the label and data separately. Chao et al. teaches in FIG. 16 to separate a packet into header and data, update the header to reflect information changes and recombine the new header with the data. One of ordinary skill in the art would have been modified to combine the teaching of Chao et al. with the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to separately process the data and header and update the header with new information, as taught by Chao et al., in the ATM switch of Cisneros et al. because header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination.

24. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Boncek (U.S. Patent 5,617,233) and Chao et al. (H. Chao et al., "A Photonic Front-End Processor in a WDM ATM Multicast Switch", Journal of Lightwave Technology, Vol. 18, No. 3, March 2000).

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Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The differences between Cisneros et al. and the claimed invention are (a) Cisneros et al. does not teach a channel for label information, and (b) the processing of the label and data signals. Boncek teaches in FIG. 1 and FIG. 2 that header and data can be transmitted in two different wavelengths and a couple is used to separate the header and the data, process the header and data and then combine them with an optical combiner. Chao et al. teaches in FIG. 16 to separate a packet into header and data, update the header to reflect information changes and recombine the new header with the data. One of ordinary skill in the art would have been modified to combine the teaching of Boncek and Chao et al. with the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process and header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use separate channels for header and data signal, as taught by Boncek, and update the header with new information, as taught by Chao et al., in the ATM switch of Cisneros et al. because using separate channels for header and data signal simplifies the header update process and header that contains dynamic information reflects the routing status of the packet and facilitates the downstream routing of the packet toward its destination.

25. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cisneros et al. (U.S. Patent 5,539,559) in view of Spring et al. (J. Spring et al., "Photonic Header Replacement for Packet Switching", Electronics Letters, Vol. 29, No. 17, 19th August 1993).

Cisneros et al. discloses in FIG. 1 an ATM switch with a contention resolution device (CRD). Cisneros et al. teaches various methods for resolving wavelength contention. In particular, Cisneros et al. teaches in FIG. 10 and col. 11, line 60-col. 12, line 35 in-band wavelength conversion for resolving wavelength contention among packets. The difference between Cisneros et al. and the claimed invention is the processing of the signal. Spring et al. teaches in FIG. 1 a header (label) replacement module. FIG. 1 comprises splitters to split the signal into 3 branches. The O/E device extracts the header from the signal; SOA2 filters the signal and acts as a modulator for the new header; SOA1 filters the data to remove the old header. The new header and the data signal are combined at the output. One of ordinary skill in the art would have been motivated to combine the teaching of Spring et al. with the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the header replacement circuit of Spring et al. in the ATM switch of Cisneros et al. because the circuit of Spring et al. can swap labels with high data rate.

Allowable Subject Matter

26. Claims 10 and 20 are allowed.

Response to Arguments

27. Applicant's arguments with respect to claims 1-9, 11-19 and 21-42 have been considered but are moot in view of the new ground(s) of rejection.

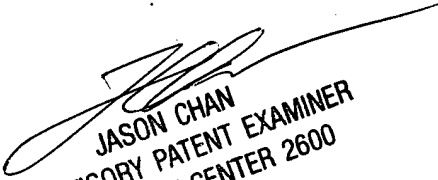
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl


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